

the endless belt having a thickness not larger than 1/3 of the slit-width of the circular die used and having an external diameter of more than 100% but less than or equal to 400% of the external diameter of the die slit of the circular die used.

REMARKS

The claims are 1-30, with claims 1, 14 and 30 being independent. Claims 4, 6 and 7 have been cancelled. Claims 1 and 30 have been amended to include the features of cancelled claims 4 and 7. Claim 2 has been amended to provide terminal punctuation. Claims 10 and 11 have been amended for clarification. No new matter has been added. Reconsideration of the present claims is expressly requested.

Applicants hereby affirm election of group I, claims 1-13 and 30, directed to an endless belt. Under M.P.E.P. § 821.04, Applicants request rejoinder of Group II, claims 14-29, directed to a method for making an endless belt of Group I in the event that the claims of Group I are allowed. If needed, Applicants request an opportunity to amend the claims of Group II to be commensurate with claims allowed in Group I.

Claims 10 and 11 stand rejected under 35 U.S.C. § 112, second paragraph, as being allegedly indefinite. In particular, the Examiner alleged that the phrase "maximum value is within 100 times the minimum value thereof" is unclear. Applicants have amended claims 10 and 11 to clarify the meaning of this phrase. Withdrawal of the indefiniteness rejection is respectfully requested. W.D.

Claims 1-3, 9-13 and 30 have been rejected under 35 U.S.C. § 103(a) as being allegedly obvious from U.S. Patent No. 5,079,121 (Facci) in view of JP 4-255332 (Mitsubishi). Claims 1-13 and 30 have been rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over U.S. Patent No. 5,525,446 (Sypula) in view of Mitsubishi. The grounds of the rejections are respectfully traversed.

Prior to addressing the merits of the rejections, Applicants would like to briefly point out some of the key features and advantages of the presently claimed invention. The present invention is directed to an endless belt that is formed by blown-film extrusion. The external diameter of the belt is greater than 100%, but does not exceed 400% of the external diameter of the die slit. As a result of such an extrusion, a resin film having a diameter that is larger than that of the die slit and a very small thickness, which is not larger than 1/3 of the slit width, is easily formed.

However, a resin film of these proportions also tends to be of uneven thickness, increasing the strain on and reducing the durability of the belt. Thus, Applicants have discovered that using a thermoplastic resin having the diphenyl sulfone structure as in claim 1 allows to utilize the melt extrusion method for forming a belt of the above-described proportions with an even thickness and excellent strength and durability. Furthermore, the endless belt as presently claimed decreases production costs due to a reduced quantity of the materials used (Specification, page 12, lines 11-18).

Facci is directed to a seamless polymeric belt. This reference fails to teach or suggest forming an endless belt having an external diameter that is greater than 100%, but does not exceed 400% of the external diameter of the die slit and thickness that is not greater than 1/3 of the slit width by melt extrusion using a circular die. These dimensions are not conventional values that can be arrived upon by simple optimization.

uphold?
-ap

As discussed above, the melt-extruded rubber film sized as in the present invention tends to have an uneven thickness that results in inferior belts that have low durability due to increased strain. Indeed, only an extremely limited number of thermoplastic resins, such as a diphenyl sulfone of claim 1 of the present invention, can undergo melt extrusion, be sized as in the present invention and produce a highly durable, excellent endless belt.

While Facci does mention that a diphenyl sulfone is suitable for an endless belt, it does not teach or suggest that this particular type of compounds results in an endless belt of the dimension as disclosed by the present invention having superior durability or that this compound is even marginally better than a vast number of resins that are listed at col. 11, lines 18 through col. 12, line 6.

As a matter of law, "a reference must be considered not only for what it expressly teaches, but for what it fairly suggests." In re Baird, 29 U.S.P.Q2d (BNA) 1550, 1552 (Fed. Cir. 1994); In re Bruckel, 201 U.S.P.Q. (BNA) 67, 70 (C.C.P.A. 1979). A disclosure of a vast number of compounds does not automatically render a claim obvious, particularly when the disclosure indicates a preference leading away from the claimed compounds. See In re Baird at 1552. In In re Baird, the Federal Circuit reversed the decision of obviousness by the Board of Patent Appeals and Interferences stating that in view of a large generic disclosure and the fact that the compounds that the prior art reference identified as "typical", "preferred" and "optimum" were different from the claimed compounds, the prior art reference could not be considered to teach or fairly suggest the claimed compounds. See id.

Applicants respectfully submit that the same factual scenario has occurred in the present case. Facci lists "typical" resins at col. 11, line 67 through col. 12, line 2 and

"preferred" compounds at col. 11 lines 51-53. However, none these compounds is a diphenyl sulfone.

Facci fails to recognize a problem of compromised durability when an endless belt is melt-extruded to have dimensions as in the present invention. Clearly, there can be no teaching, suggestion or motivation for a modification when there is no recognition of the problem. Accordingly, Facci cannot affect the patentability of the present invention.

Sypula is directed to a method of producing an endless belt using a circular die. As acknowledged by the Examiner, this reference is silent with respect to the particular dimensions of the belt that are presently claimed. However, the Examiner has alleged that the diameter is of a conventional value, which can be determined by optimization. Applicants respectfully disagree.

As discussed above with respect to Facci, the dimensions of the belt as presently claimed are not conventional values that can be arrived upon by simple optimization. Melt-extruding the resin film to form a belt having a diameter and thickness as presently claimed tends to result in belts with uneven thickness, leading to inferior durability due to increased strain. Only an extremely limited number of resins can be used produce an excellent melt-extruded belt of such dimensions. Thus, a simple size optimization would lead one skilled in the art away from the presently claimed dimensions unless a specific resin is used.

While Sypula does list a diphenyl sulfone as a possible resin, it does not teach or suggest that this resin is specifically suitable for the melt-extruded belt sized as in the present invention, or provide one iota of disclosure regarding this type of compounds

being superior to others in a long list of compounds that it provides (Col. 2, line 57 - Col.

3, line 15; Col. 5, lines 35-57). In fact, at col. 5, line 44, Sypula mentions that polyethylene may be used as a suitable thermoplastic resin. Comparative Example 1 in the subject application clearly shows that this material results in a belt that has insufficient strength and durability. Thus, clearly, Sypula does not recognize the importance of a specific resin to form a melt extruded belt sized as in the present invention. Accordingly, Sypula cannot affect the patentability of the present invention.

Mitsubishi cannot supplement the missing teachings of Facci and Sypula. While it discloses that a circular die is used to produce an endless belt using an extrusion method, it does not disclose, teach or suggest an endless belt having an external diameter that is greater than 100%, but does not exceed 400% of the external diameter of the die slit and thickness that is not greater than 1/3 of the slit width. In fact, it is understood to disclose a belt that has an external diameter smaller than the width of the die slit. ^{not} necessarily

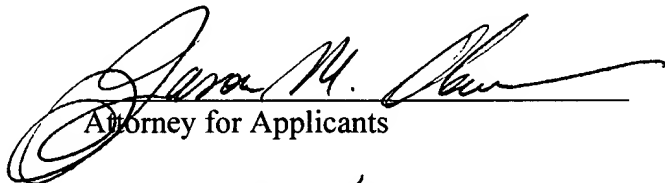
Also, while this reference discloses polysulfone and polyethersulfone as examples of usable resins, these resins are genres comprising thousands of possible compounds of which diphenyl sulfones are only a minute fraction. Applicants do not understand Mitsubishi to specifically disclose diphenyl sulfones or to teach or suggest that these compounds are suitable for the present invention. Mitsubishi is not understood to teach or suggest that an overwhelming majority of compounds it discloses would not result in a strong and durable endless belt sized as in the present invention. Accordingly, the disclosure in Mitsubishi is legally insufficient to affect the patentability of the present invention.

In sum, Facci, Sypula and Mitsubishi, whether considered alone or in any combination, fail to disclose teach or suggest the present invention. Specifically, they are silent with respect to the dimensions of the belt as presently claimed, which is key feature of the present invention, requiring recognition that only a specific type of resins can be used. These references show no such recognition. They do not teach or suggest that diphenyl sulfones can be used to make superior, durable endless belts sized as recited in the present claims. Accordingly, Facci, Sypula and Mitsubishi cannot render the present invention unpatentable. Withdrawal of the rejections over these documents is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and passage to issue of the present case.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address given below.

Respectfully submitted,


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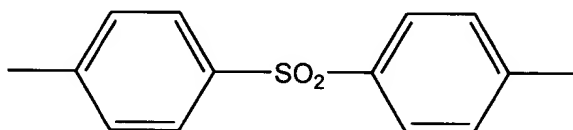
APPENDIX

Application No. 09/09/467,986
Attorney Docket No. 35.C14120

IN THE CLAIMS:

Claims 4, 6 and 7 have been cancelled. Claims 1, 2, 10, 11 and 30 have been amended as follows:

1. (Amended) An endless belt for electrophotography which is obtainable continuously by melt extrusion from a circular die; the endless belt comprising a layer containing a thermoplastic resin having a diphenyl sulfone structure represented by the following Formula (1)

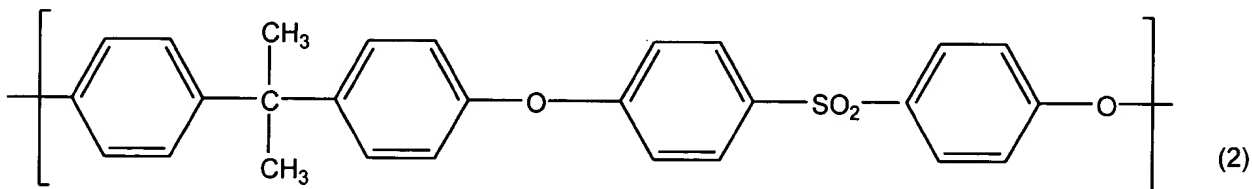


(1)

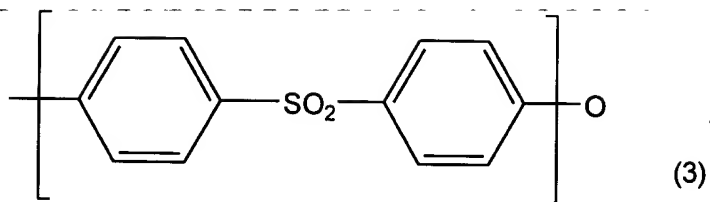
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the endless belt having a thickness not larger than 1/3 of the slit-width of the circular die used and having an external diameter of more than 100% but less than or equal to 400% of the external diameter of the die slit of the circular die used.

2. (Amended) An endless belt according to claim 1, wherein said thermoplastic resin having a diphenyl sulfone structure is a thermoplastic resin having a structural unit represented by the following Formula (2) or (3)



(2)



4. Cancelled.

6. Cancelled.

7. Cancelled.

10. (Amended) An endless belt according to claim 1, which has a maximum value of a surface-direction resistance that [whose maximum value] is not greater than [within] 100 times a [the] minimum value of said surface-direction resistance [thereof].

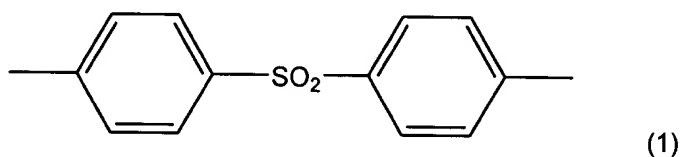
11. (Amended) An endless belt according to claim 1, which has a maximum value of a thickness-direction resistance that [whose maximum value] is [within] not greater than 100 times a [the] minimum value of said thickness-direction resistance [thereof].

30. (Amended) An image forming apparatus for electrophotography

comprising;

an endless belt which is obtainable continuously by melt extrusion
from a circular die;

said endless belt comprising a layer containing a thermoplastic resin
having a diphenyl sulfone structure represented by the following Formula (1)



the endless belt having a thickness not larger than 1/3 of the slit-width of the circular die
used and having an external diameter of more than 100% but less than or equal to 400% of
the external diameter of the die slit of the circular die used.